

WHAT IS CLAIMED IS:

1. A substrate cleaning apparatus for cleaning a substrate of a liquid crystal display panel comprising:

a first cleaning module on a substrate, said substrate having upper and lower surfaces; and

a side-cleaning module at a side surface of the substrate.
2. The apparatus of claim 1, wherein the side-cleaning module includes a brush cleaner.
3. The apparatus of claim 2, wherein the brush cleaner extends partially along the side surface of the substrate.
4. The apparatus of claim 2, wherein the brush cleaner of the side-cleaning module is rotatable.
5. The apparatus of claim 2, wherein the side-cleaning module further comprises a water jet device.
6. The apparatus of claim 5, wherein the water jet device generates ultrasonic waves onto the side surface of the substrate.
7. The apparatus of claim 5, wherein the water jet device generates ultrasonic waves onto the side surface of the substrate at a high pressure.

8. The apparatus of claim 1, wherein the side-cleaning module comprises a vibration generating device.
9. The apparatus of claim 8, wherein the vibration generating device includes a sonar.
10. The apparatus of claim 8, wherein the vibration generating device generates ultrasonic waves onto the side surface of the substrate.
11. The apparatus of claim 8, wherein the vibration generating device jets water onto the side surface of the substrate.
12. The apparatus of claim 1, wherein the first cleaning module includes a brush cleaner.
13. A method of cleaning a substrate of a liquid crystal display panel comprising:

providing a first cleaning module on a substrate, said substrate having upper and lower surfaces;

providing a side-cleaning module on a side surface of the substrate;

removing foreign substances on a side surface of the substrate using the side-cleaning module; and

removing foreign substances on the upper and lower surface of the substrate using the cleaning module.
14. The method of claim 13, wherein the side-cleaning module is rotatable.

15. The method of claim 14, wherein the side-cleaning module extends partially along the side surface of the substrate.

16. The method of claim 13, wherein the first cleaning module is rotatable.

17. The method of claim 13, wherein the first cleaning module includes upper and lower cleaning brushes.

18. The method of claim 17, wherein the upper and lower cleaning brushes are arranged at the upper and lower surfaces of the substrate, respectively.

19. The method of claim 13, further comprising cleaning the side surface of the substrate using a water jet device.

20. The method of claim 19, wherein the water jet device generates ultrasonic waves.

21. The method of claim 19, wherein the cleaning step includes jetting water onto the side surface of the substrate at a high pressure.

22. The method of claim 21, wherein the water includes de-ionized water.

23. A method of cleaning a substrate of a liquid crystal display panel comprising:

providing a cleaning module at a substrate, said substrate having upper and lower surfaces;

providing a side-cleaning module arranged at a side surface of the substrate;

removing foreign substances on a side surface of the substrate using the side-cleaning module;

removing foreign substances on the upper and lower surface of the substrate using the cleaning module; and

cleaning the side surface of the substrate using a water jet device.

24. The method of claim 23, wherein the water jet device causes vibration on the side surface of the substrate.

25. The method of claim 24, wherein the vibration is generated by ultrasonic waves.

26. The method in claim 23, wherein the cleaning step includes jetting water onto the side surface of the substrate at a high pressure.

27. The method of claim 26, wherein the water includes de-ionized water.